EXHIBIT A
WORK STATEMENT

OVERALL PROJECT GOALS

While an increasing portion of electronic office equipment (e.g., personal computers, scanners, printers, copiers, fax machines) has the capability to reduce energy consumption during periods of inactivity, a large portion of these devices do not effectively manage power due to poorly designed power-management user interfaces. A properly designed interface enables a user to activate the office equipment s power-saving features, and provides users with feedback when these features are operating. The overall goal of this project is to develop, test and disseminate a new specification for power-management user interfaces which will standardize their appearance and function, so that users can better manage energy use by electronic office equipment. This standard will be voluntary — no equipment manufacturer will be required to use it. Furthermore, the standard will not be rigid, but will lay out principles and guidelines that interface designers can adapt to their specific needs and opportunities.

This project supports the PIER program objective of improving the energy cost and value of California s electricity system by enabling the power-saving features of office equipment to be enabled and used more effectively, thereby reducing energy use and cost for users of commercial office equipment and appliances. It also contributes to the PIER program objective of improving the reliability and quality of California s electricity by reducing the peak electrical demand created by office equipment in commercial buildings.

TECHNICAL PERFORMANCE OBJECTIVE

The technical objective of this project is to design a new, standard user interface for office equipment power management, which is acceptable to a Professional Advisory Committee, comprised of representatives from electronic equipment manufacturers, standards organizations, and the ENERGY STAR Program (which is sponsored by the Environmental Protection Agency and the Department of Energy).

The overall economic objective of this project is to reduce energy costs by avoiding or lowering the energy use of electronic office equipment when it is not needed. This objective would be accomplished by improving the interface between users and the equipment s power management features, so that audits and night-time observations of office equipment s power-management configurations and status can be made more easily. This project, however, will produce no measurable energy-cost savings during the contract term.

[Task 1 – Administrative only]

TECHNICAL TASKS

The project's work scope involves the following technical tasks:

Task 2.1 Update Interface Standard Development Plan
Task 2.2 Conduct Research
Task 2.3 Develop, Test and Disseminate the Interface Standard for PAC Acceptance

Critical Project Reviews

The Commission will conduct critical project reviews at the conclusion of the following subtasks:

- Subtask 2.1.b Prepare for and Conduct Initial PAC Meeting
- Subtask 2.3.b Conduct Second PAC Meeting

Critical project reviews are meetings between the Contractor, the Commission Contract Manager and other individuals selected by the Commission Contract Manager to provide objective, technical support to the Commission. The purpose of these meetings is to discuss with the Contractor the status of the project and its progress toward achieving its goals and objectives. These meetings may take place at the Commission offices in Sacramento, or at another, reasonable location determined by the Commission Contract Manager.

Prior to this critical project review meeting, the Contractor shall provide the task deliverable(s) to the Commission Contract Manager sufficiently in advance to allow the Contract Manager's review of the deliverable document(s) before the review meeting. If not already defined in the Work Statement, the Commission Contract Manager shall specify the contents of the deliverable document(s).

At the project review meeting, the Contractor shall present the required technical information and participate in a discussion about the project with the Commission Contract Manager and other meeting attendees, if any.

Following that meeting, the Commission Contract Manager will determine whether the Contractor is complying satisfactorily with the Work Statement and whether the project is demonstrating sufficient progress toward achieving its goals and objectives to warrant continued PIER financial support for the project. If the Commission Contract Manager concludes that satisfactory progress is *not* being made, this conclusion will be referred to the Commission's Research, Development and Demonstration Policy Committee for its concurrence. As an outcome of each critical project review, the Commission Contract Manager will provide a written response to the Contractor indicating his or her conclusions about the project to date. If appropriate, a written response from the Commission's Contract Officer may direct the Contractor to not proceed with a specific task or to stop work.

Technical Task Descriptions

The Contractor will perform the following technical tasks:

Task 2.1 Update Interface Standard Development Plan

The objective of this task is to update the Interface Standard Development Plan, using input from a Professional Advisory Committee (PAC), and to obtain PAC agreement on the purpose and intended products of this project.

> Subtask 2.1.a Conduct Institutional Review and Assemble Professional Advisory Committee

In this subtask, the Contractor will identify and contact office equipment manufacturers, trade associations, standards organizations and other institutions which should be involved in defining a power management user interface standard or whose input may be relevant to this user interface development project. Organizations the Contractor will contact include, but are not limited to: the Environmental Protection Agency (EPA), the Department of Energy (DOE), the International Electrotechnical Commission (IEC), the International Organization for Standardization (ISO), the National Institute of Standards and Technology (NIST), the American National Standards Institute (ANSI), the American Society for Testing and Materials (ASTM), the Information Technology Institute (ITI), Video Electronics Standards Association (VESA),

and referrals from these organizations to individual electronic office equipment and appliance manufacturers and their trade associations, software developers and interface designers.

From these contacts, the Contractor will attempt to learn industry s perceptions about the need for this project and the status of any ongoing or planned interface development work. The Contractor will interview standards organizations to determine which technical committees should be targeted for the standard s future dissemination and to understand the relevant processes necessary for that dissemination to occur. The Contractor will identify what existing standards might be affected, if a new standard is needed, if an existinging standard should be modified, and which standards organizations technical committees need to be approached. The Contractor will also seek comments from people from other countries to determine how power management approaches are similar and different in languages other than English.

The Contractor will prepare a written Institution Review Research Findings Report, which provides the necessary background information from this subtask's institutional review and prior research to orient PAC members on this topic.

When making these contacts, the Contractor will also solicit their participation in this research project by asking if they are interested and willing to serve on a Professional Advisory Committee (PAC), attend PAC meetings, and review project plans and products. Based on feedback from this inquiry, the Contractor will prepare a list of approximately 12 individuals, whose participation it believes would best meet the needs of the project. The Contractor will submit this list of recommended PAC members to the Commission Contract Manager for review and approval, with the following additional information:

- sponsoring organization of each individual
- why this individual should be included in the PAC
- whether the individual or the individual's sponsoring organization would be willing to cover travel and per diem expenses (i.e, willing to participate at no cost to this contract) or whether this individual insists on payment and/or reimbursement for travel and/or per diem expenses as a condition of participation, and a projected cost for this individual to attend a PAC meeting held at Contractor's headquarters.

The Commission Contract Manager will provide feedback to the Contractor on the proposed membership list within two weeks of its submittal. The Contractor will invite approved individuals to become members of the PAC and send letters of confirmation to all individuals who agree to become PAC members. The Contractor will provide a list of all confirmed PAC members to the Commission Contract Manager.

NOTE: During this project, the Contractor may recommend changes in PAC membership to the Commission Contract Manager as conditions warrant.

Deliverables
Institution Review Research Findings Report
Recommended list of PAC members and accompanying information
List of confirmed PAC members.

Subtask 2.1.b Prepare for and Conduct Initial PAC Meeting

The Contractor will update its current project plan, using information gathered from the institutional review research, and submit this Updated Project Plan to the Commission Contract Manager.

The Contractor will determine a convenient date, time and location to hold the initial PAC meeting, so that a minimum of two thirds of PAC members can be present. The Contractor will notify all PAC members and the Commission Contract Manager of the meeting's date, time and location.

The Contractor will distribute copies of the Updated Project Plan and the Summary of Institution Review Research Findings to PAC members in advance of this meeting to allow sufficient time for them and others in their organizations to review the materials and provide full and informed comments.

The Contractor will plan and conduct the initial PAC meeting. At the meeting, the Contractor will present the project s overall goals, technical and economic objectives, findings of its institutional review research, and the updated project plan. The Contractor will solicit PAC member comments and other information on how to make best use of project resources and increase the chances of project success. The Contractor-led discussion will be of sufficient depth to allow PAC members to identify elements of the Updated Project Plan, which should be added, modified, or dropped as unnecessary. The Contractor will strive to reach a consensus among PAC members on the project s problem statement, goals, objectives and planned activities.

The Contractor will prepare a written Summary of Initial PAC meeting, which provides a summary of substantive PAC comments and carefully considers PAC-member suggestions to revise the plan to contribute to project success. The report will also include Contractor s comment on the suggested refinements to the project plan, as proposed during PAC meetings.

Based on Contractor review and consideration of PAC input, the Contractor will revise the Updated Project Plan and submit a Revised Project Plan to the Commission Contract Manager for review and approval.

NOTE: At any point in the project, PAC members may suggest additional refinements to the project plan. The Contractor will identify any of these that it thinks are appropriate and will present them to the Commission Contract Manager for consideration.

Deliverables
Updated Project Plan
Advanced notice of initial PAC meeting
Summary of Initial PAC Meeting
Revised Project Plan

The Commission Contract Manager will conduct a Critical Project Review at the conclusion of this task.

Task 2.2 Conduct Research

The objective of this task is to conduct the research necessary to design a new standard interface for electronic office equipment power management. Specifically, the Contractor will learn what interface designs have and have not worked and what the art and science of interface design suggest about an ideal interface.

Subtask 2.2a Assess Devices and Interfaces

In this subtask, the Contractor will survey the current implementation of power management interfaces. The Contractor will inspect different types of electronic office equipment, including computers (PCs and other), monitors, fax machines, printers, copiers, and scanners. The Contractor will identify which types of equipment currently have power management capability and which types do not have this capability today, but will likely have it in the future.

For each equipment type with power management capability, the Contractor will identify interface characteristics that the devices have, such as delay timers, day/time controls, responses

to external inputs (such as occupancy or computer network activity), and whether the equipment controls itself or is controlled by another, specific type of equipment. For equipment that is likely to gain power management capability in the future, the Contractor will predict the interface characteristics each type of equipment could have and how it will likely be controlled.

Within each equipment type, the Contractor will survey a wide variety of brands and models to identify and evaluate their power management controls and indicators. The Contractor will research the specific features present in the interface, the terms and symbols used, implied behavior, helpful information provided in the interface (e.g. the relative amount of energy saving from different options), and the underlying metaphors used to communicate the idea of (and rationale for) power management. The Contractor will document the "indicators" that report to users whether power management is occurring, such as power lights changing color or blinking, displays dimming or turning off, textual or symbolic indicators on a display, changes in noise, vibration, or heat emissions, or summaries of power status over time. The Contractor will also document the degree of agreement between terms and symbols on screens and those used next to power switches on the same device.

With the data gathered, the Contractor will categorize power management control elements and strategies to determine whether there are distribution patterns across device types, vintage, etc. With collected information on PCs and associated equipment stocks, the Contractor will deduce which control strategies are most prevalent. The Contractor will inventory how controls are described or represented in information apart from the controls, themselves, such as in documentation (on-line, on paper, or otherwise) and marketing materials.

The Contractor will assess and document the physical locations of the controls (in hardware and software terms), as necessary. The Contractor will also assess and document the types of hardware interfaces that electronic office equipment has which also affect power management controls, as necessary. These hardware interfaces may include a high-resolution screen, as on a PC; a touch screen, as on some copiers; a small LCD or LED character display, as on some printers and copiers; or an interface accessed from a second device via network connections.

Subtask 2.2.b Conduct Literature Review and Field Research

The Contractor will review the literature on user interfaces for electronic and other equipment and, to a lesser extent, other devices for guidance in choosing terms, symbols, metaphors and control and indicator mechanisms. The Contractor will note cultural pitfalls (American and other) that should be avoided when choosing symbols and words. The Contractor will also research and record which controls have redundant symbology and, therefore, may be more resistant to misinterpretation than single-symbol controls.

The Contractor will review the development of other relatively standard user interfaces (e.g., for convenience, safety or other goals) that may indicate pitfalls or opportunities to standardize power management interfaces. The Contractor will also seek examples of failed or poorly executed standard interfaces.

To gain more insight into the human dimensions of controls, the Contractor will conduct structured interviews with:

1) a variety of typical office workers, management information system (MIS) managers, office equipment repair technicians, and energy managers to gather a range of opinions, behaviors, ideas and a general sense of the prevalence of these ideas and opinions. The structured interviews will determine these users' reactions to power management controls and indications, their assumptions about them (to determine if they differ from reality), their opinions on how the controls and indications could be improved and on which controls and indications work particularly well. The Contractor will also test a variety of interface designs and elements on users to assess the degree to which these designs and elements are understood, misinterpreted, or seen as confusing.

2) individuals responsible for designing power management interfaces and individuals that market the devices and must explain them to customers. These structured interviews will be conducted to determine why the particular implementations were chosen, what alternatives were discarded and why, and what is seen as a better or optimal user interface.

The Contractor will analyze data gathered from the Subtask 2.2.a and Subtask 2.2.b, and prepare a written User Interface Assessment Report, which contains relevant findings about the approaches and factors which seem particularly relevant for an optimal standard user interface for power management controls.

Deliverable
User Interface Assessment Report.

Task 2.3 Develop, Test and Disseminate the Interface Standard for Industry Acceptance

The objective of this task is to develop proposed interface standards that are acceptable to the PAC.

Subtask 2.3.a Develop Proposed Interface Standard

The Contractor will develop an interface structure and interface details, which together comprise the interface standard. This structure will include the types of elements that the standard should include and their relationship to each other. The Contractor will seek logical groupings of devices or interface types that suggest specifications tailored to that group, based on both capability and need. The Contractor will identify other elements of the structure; such as concepts for which standard terms and symbols are needed, as well as overall principles from which the standards should be derived or with which they should be consistent.

The structure will also define the intended limits of the standard.

The Contractor will identify and document ways that related standard controls such as imaging could be structured.

The Contractor will identify one or more promising approaches for a standard power management user interface, and determine how these approaches would be implemented in the range of electronic office equipment.

The Contractor will also develop interface details. These details will fill out the interface structure with specifics such as standard terms and symbols, indicators, and "operational defaults." The Contractor will create mock-ups of the controls, both entirely new ones, and adaptations of existing controls to make them conform to the standard. The mockups will be presented as static, graphic images.

The Contractor will prepare a Proposed Interface Standard containing both the interface structure and interface details, and a discussion of the rationale or reasons for the choices made.

Deliverable
Proposed Interface Standard

Subtask 2.3.b Prepare for and Conduct Second PAC Meeting

The Contractor will develop and/or distribute three documents for the second PAC meeting:

- Preliminary Field Test Plan Outline (to be developed under this subtask)

- User Interface Assessment Report (developed under Subtask 2.2.b)
- Proposed Interface Standard (developed under Subtask 2.3.a)

The Contractor will distribute these copies to each PAC member in advance of the second meeting to allow them time for critical review, to consult with others in their organizations, and to provide full and informed comments.

The purpose of the Preliminary Field Test Plan Outline is to briefly describe to PAC members the activities Contractor may conduct in Subtask 2.3.c to subject the refined standards to broad critical review by average users. The purpose of the testing with average users is to determine how well they understand the standard and how easily they are able to modify it to their needs. The Preliminary Field Test Plan Outline will briefly describe:

- how users will be approached and recruited to participate in the test
- sample size of users
- which design elements and other aspects of the standard will be tested
- the expected start and end dates of the test period
- the methods for administering the test, the methods for collecting test data and ensuring data quality
- an explanation of how the Contractor will evaluate test results.

The Preliminary Field Test Plan Outline will also discuss how the Contractor intends to encourage others to organize and conduct testing internationally and sharing these test results with the Contractor.

The Contractor will determine a convenient date, time and location to hold the second PAC meeting so that a minimum of two thirds of PAC members can be present. The Contractor will notify all PAC members and the Commission Contract Manager of the meeting's date, time and location.

The Contractor will plan and conduct the second PAC meeting. At the meeting, the Contractor will review research findings and summarize the main points and conclusions. Then, the Contractor will present the Proposed Interface Standard and its rationale for the choices made so that reviewers and those who will consider adopting the standard will best understand them. The Contractor will lead a discussion and solicit comments and suggested improvements to the Proposed Interface Standard. The Contractor will strive to reach a consensus among PAC members on the Proposed Interface Standard.

Deliverable
Preliminary Interface Field Test Plan Outline
Advance Notice of Second PAC Meeting

The Commission Contract Manager will conduct a Critical Project Review at the conclusion of this subtask.

Subtask 2.3.c Field Test Interface Standard

Based on input from the PAC and other equipment manufacturers, standards organization representatives and others chosen by the Contractor, the Contractor will refine further the standard structure and details.

The Contractor will also incorporate PAC member comments and suggestions to prepare a Draft Field Test Plan and will submit it to the Commission Contract Manager for review and comment. If necessary, the Contractor will prepare a Final Field Test Plan, which incorporates appropriate comments and suggested improvements received from the Commission Contract Manager and submit it to the Commission Contract Manager for review and approval.

Upon approval of the Field Test Plan, the Contractor will conduct the field test. During this testing, the Contractor will document any user problems and substantial deficiencies that users identify. If time and the project budget permit, the Contractor may modify the standard further to overcome the perceived deficiencies and retest the revised standard to determine user response.

The Contractor will prepare a written Field Test Report, which includes a summary of the test plan and test activities, findings, conclusions and recommendations for a Final User Interface Standard. The Contractor will distribute copies of the Field Test Report to all PAC members and the Commission Contract Manager.

Deliverables
Draft Field Test Plan
Final Field Test Plan, if needed
Field Test Report

Subtask 2.3.d Conduct Final PAC Meeting

The Contractor will determine a convenient date, time and location to hold the final PAC meeting, so that a minimum of two thirds of PAC members can be present. The Contractor will notify all PAC members and the Commission Contract Manager of the meeting s date, time and location.

The Contractor will convene the final PAC meeting to review the Field Test Report and to strive to reach consensus among PAC for approval of the Contractor s recommended Final User Interface Standard.

The Contractor will prepare a written Summary of the Final PAC Meeting, which discusses the extent to which the PAC accepted the Final User Interface or whether there is substantial conflict among PAC members regarding the format and content of the standard to warrant not disseminating it to manufacturers and standards organizations under Subtask 2.3.e of this contract.

Deliverables
Advance notice of Final PAC Meeting
Summary of Final PAC Meeting

Subtask 2.3.e Disseminate Interface Standard to Industry

The purpose of this subtask is to initiate processes to have the Interface Standard adopted by national and international standards organizations and by leading electronic office equipment manufacturers. The Contractor will disseminate copies of the Final Interface Standard to all interested parties and post it on its web site.

Using information collected from Subtask 2.1.a, the Contractor will contact leading equipment manufacturers, particularly those in California and offer to provide them copies of the Final Interface Standard. The Contractor will distribute copies of the Final Interface Standard to all

interested parties and will maintain a log of which manufacturers requested and declined to receive copies.

Using information collected from Subtask 2.1.a, the Contractor will also contact standards organizations, which Contractor recognizes as appropriate targets for a standard dissemination effort. The Contractor will conduct briefings, presentations at standards organization meetings to shepherd the proposed standard through appropriate national and international standards processes.

The Contractor's dissemination activities will be reported in its Quarterly Progress Reports.

[Task 3 – Reporting to project sponsor]